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Application No.	Applicant(s)	
10/735,913	KIM, JAE-HONG	
Examiner	Art Unit	
Craig A. Thompson	2813	

Notice of Allowability	Examiner	Art Unit	
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	Craig A. Thompson	2813	
The MAILING DATE of this communication appe All claims being allowable, PROSECUTION ON THE MERITS IS herewith (or previously mailed), a Notice of Allowance (PTOL-85) NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RI of the Office or upon petition by the applicant. See 37 CFR 1.313	(OR REMAINS) CLOSED in this apport or other appropriate communication GHTS. This application is subject to	plication. If not include will be mailed in due	ed course. THIS
1. This communication is responsive to 12/16/2003.			
2. 🔀 The allowed claim(s) is/are <u>1-20</u> .			
3. \boxtimes The drawings filed on <u>12/16/2003</u> are accepted by the Exam	miner.		
 4. Acknowledgment is made of a claim for foreign priority un a) All b) Some* c) None of the: 1. Certified copies of the priority documents have 2. Certified copies of the priority documents have 3. Copies of the certified copies of the priority documents have International Bureau (PCT Rule 17.2(a)). * Certified copies not received: Applicant has THREE MONTHS FROM THE "MAILING DATE" noted below. Failure to timely comply will result in ABANDONM THIS THREE-MONTH PERIOD IS NOT EXTENDABLE. 	been received. been received in Application No currents have been received in this of this communication to file a reply	national stage applica	
5. A SUBSTITUTE OATH OR DECLARATION must be submit INFORMAL PATENT APPLICATION (PTO-152) which give			IOTICE OF
 6. CORRECTED DRAWINGS (as "replacement sheets") muss (a) including changes required by the Notice of Draftspers 1) hereto or 2) to Paper No./Mail Date (b) including changes required by the attached Examiner's Paper No./Mail Date Identifying indicia such as the application number (see 37 CFR 1. each sheet. Replacement sheet(s) should be labeled as such in the Tolday of the deposit o	on's Patent Drawing Review (PTO- s Amendment / Comment or in the C .84(c)) should be written on the drawing the header according to 37 CFR 1.121(c sit of BIOLOGICAL MATERIAL r	Office action of ngs in the front (not the d).	•
 Attachment(s) 1. ☑ Notice of References Cited (PTO-892) 2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948) 3. ☑ Information Disclosure Statements (PTO-1449 or PTO/SB/0 Paper No./Mail Date 12/16/03 4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material 	5. Notice of Informal P 6. Interview Summary Paper No:/Mail Dat 7. Examiner's Amendr 8. Examiner's Stateme 9. Other	(PTO-413), te ment/Comment	

Art Unit: 2813

REASONS FOR ALLOWANCE

The following is an examiner's statement of reasons for allowance: prior art of record does not describe or suggest applicant's invention set forth in claims 1-11, a method for manufacturing a shallow trench isolation wherein a trench is formed in a semiconductor substrate, a hydrogen based high density plasma oxide layer is formed, and nitrogen based high density plasma a oxide layer is formed, and a helium based high density plasma oxide are formed in conjunction with the step a carrying out a two stage thermal process for removing fluorine in the NF₃-based oxide layer, in the context of the recited processes. Similarly prior art of record does not describe or suggest the invention of claims 12-22 wherein the thermal process for removing fluorine is the last recited process step of the independent claim, and in the context of the recited processes.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Cited Prior Art

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kim et al. (U.S. Patent No. 6,660,613) teaches using a high density plasma (HDP) in shallow trench isolation, but teaches adding (not extracting) fluorine for removing dangling bonds (see column 3 line 42 to column 4, line 44). Kim et

al. (U.S. Patent 6,849,520) teaches forming a shallow trench isolation (title) and forming an oxide layer with fluorine as well as exposure to a fluorine atmosphere (column 2, lines 35-68). Kim et al. (US Patent Publication No. US 2004/0082143 A1) teaches a method for forming an STI type isolation (title) including exposure to fluorine (see 0014-0016). Kim et al. (US Patent Publication US 2003/0045070 A1) teaches forming an STI type isolation including exposure to fluorine (see 0026). However, none of these references, in conjunction with the prior art, teach or suggest the formation of a H₂-HDP oxide, a NF₃-based HDP oxide and a He-HDP oxide in conjunction with the two-stage thermal process for removing fluorine of the instant invention.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Craig A. Thompson whose telephone number is (571)272-1699. The examiner can normally be reached on Monday-Friday 8:00 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr. can be reached on (571)272-1702. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the

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Craig A. Thompson Primary Examiner

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25 June 2005